

CLAIMS

What is claimed is:

1. A low pressure tire, comprising:
 - 2 a torus of flexible, substantially inelastic material, wherein the material will not deform at temperature of about 225°F, the torus includes an inner diameter surface for engaging a tire supporting rim and an outer diameter surface for contacting a support surface, wherein the torus can flatten under a load to facilitate movement of the tire over soft or irregular support surfaces; and
 - 7 a sealable opening for inflating and deflating the torus, wherein said sealable opening comprises a valve stem housing and a valve stem having a plurality of barbs which taper outwardly from the valve stem.
 - 1 2. The tire of claim 1 wherein the inside diameter of the tires' valve stem housing is less than the largest outside diameter of the valve stem barbs.
 - 1 2 3. The tire of claim 2 wherein the inside diameter up to the tires' valve stem housing is less than at least about 50 % of the largest outside diameter of the valve stem.
 - 1 4. The tire of claim 1 wherein the valve stem is a plastic or metal.
 - 1 5. The tire of claim 1 wherein the valve stem comprises at least 3 barbs.
 - 1 6. The tire according to claim 1, wherein the material is polyurethane.
 - 1 7. The tire according to claim 1, wherein the material is a material having

2 elasticity, flexibility, chemical and/or temperature tolerance characteristics similar
3 to polyurethane.

1 8. The tire according to claim 1, wherein inflation of the tire may be
2 increased to facilitate movement of the tire over a hard support surface and
3 inflation of the tire may be decreased to facilitate movement of the tire over a soft
4 support surface.

1 9. The tire according to claim 1, further comprising:
2 a radially inwardly extending flange.

1 10. The tire according to claim 1, wherein the outer diameter surface that
2 contacts the support surface is at least substantially free from reinforcing fabrics or
3 cords.

1 11. The tire according to claim 1, wherein the tire is inflated to a pressure of
2 about 1 psi to about 10 psi.

1 12. The tire according to claim 1, wherein the flexible inelastic material
2 flexes or flattens under a load but does not stretch, whereby upon further inflation
3 the tire will not expand substantially outward.

1 13. The tire according to claim 1, wherein the flexible inelastic material
2 flexes to deform but does not stretch upon encountering an obstacle when under a
3 load.

1 14. The tire according to claim 1, wherein the tire is blow molded.

1 15. A tire and wheel combination, comprising:
2 a low pressure tire comprising a torus of flexible, substantially inelastic
3 material, wherein the material will not deform at temperature of about 225°F, the
4 torus includes an inner diameter surface for engaging a tire supporting rim and an
5 outer diameter surface for contacting a support surface, wherein the torus can
6 flatten under a load to facilitate movement of the tire over soft or irregular support
7 surfaces, and a sealable opening for inflating and deflating the torus, wherein said
8 sealable opening comprises a valve stem housing and a valve stem housing a
9 plurality of barbs wherein taper inwardly in the direction of the valve stem
10 housing; and

11 a tire supporting rim comprising a cylindrical center section for engaging
12 the inner diameter surface of the tire, a pair of support flanges axially extending
13 from opposite sides of the center section for engaging the tire as it flattens under a
14 load.

1 16. The tire and wheel combination of claim 15 wherein the inside diameter
2 of the valve stem housing is less than the largest outside diameter of the valve
3 stem.

1 17. The tire and wheel combination of claim 15 wherein the inside diameter
2 of the tires' valve stem housing is less than at least about 50 % of the largest
3 outside diameter of the valve stem.

1 18. The tire and wheel combination of claim 15 wherein the valve stem is a
2 plastic or metal.

1 19. The tire and wheel combination of claim 15 wherein the valve stem
2 comprises at least 3 barbs.

1 20. The tire and wheel combination according to claim 15, wherein the
2 material that the tire is made of is polyurethane.

1 21. The tire and wheel combination according to claim 15, wherein the
2 material that the tire is made of is a material having elasticity, flexibility, chemical
3 and/or temperature tolerance characteristics similar to polyurethane.

1 22. The tire and wheel combination according to claim 15, wherein
2 inflation of the tire may be increased to facilitate movement of the tire over a hard
3 support surface and inflation of the tire may be decreased to facilitate movement
4 of the tire over a soft support surface.

1 23. The tire and wheel combination according to claim 15, wherein the
2 center section of the wheel receives an axle extending therethrough and the wheel
3 rotates about the axle.

1 24. The tire and wheel combination according to claim 15, wherein the
2 center section of the wheel engages an axle extending therethrough and the wheel
3 and the axle rotate together.

1 25. The tire and wheel combination according to claim 15, wherein the
2 wheel further comprises an axle axially extending from opposite sides.

1 26. The tire and wheel combination according to claim 15, wherein the
2 cylindrical flange portion of the wheel has a greater diameter than the diameter of
3 the inner surface.

1 27. The tire and wheel combination according to claim 15, wherein the
2 cylindrical flange portion of the wheel has a diameter less than three times the
3 diameter of the inner surface.

1 28. The tire and wheel combination according to claim 15, wherein the tire
2 further comprises a radially inwardly extending flange.

1 29. The tire and wheel combination according to claim 28, wherein the rim
2 further comprises two separable axially extending halves between which the
3 radially inwardly extending flange is clamped upon assembly of the two halves,
4 and means for securing the halves to each other.

1 30. The tire and wheel combination according to claim 15, wherein the
2 outer diameter surface that contacts the support surface is at least substantially free
3 from reinforcing fabrics or cords.

1 31. The tire and wheel combination according to claim 15, wherein the tire
2 is inflated to a pressure of about 1 psi to about 10 psi.

1 32. The tire and wheel combination according to claim 15, wherein the
2 flexible inelastic material flexes or flattens under a load but does not stretch,
3 whereby upon further inflation the tire will not expand substantially outward.

1 33. The tire and wheel combination according to claim 15, wherein the
2 flexible inelastic material flexes to deform but does not stretch upon encountering
3 an obstacle when under a load.

1 34. The tire and wheel combination according to claim 15, wherein the

2 torus has a circular area of revolution and an axial length of the tire supporting rim
3 is at least twice an undeformed radius of the circular area of revolution of the torus
4 but no greater than π times the radius.

1 35. The tire and wheel combination according to claim 15, wherein each
2 flange comprises a radially outwardly flaring conical portion extending from the
3 central section and an axially extending cylindrical flange portion extending from
4 the conical portion.

1 36. The tire and wheel combination according to claim 35, wherein the rim
2 further comprises two separable axially extending halves.

1 37. The tire and wheel combination according to claim 15, wherein the rim
2 further comprises two separable axially extending halves.

1 38. The tire and wheel combination according to claim 15, wherein the tire
2 distributes the load sufficiently to permit loads in excess of about 250 pounds per
3 tire to travel across a surface without damaging the surface.

1 39. The tire and wheel combination according to claim 15, wherein the tire
2 is blow molded.

1 40. A wheeled vehicle, comprising:
2 a frame;
3 at least one low pressure tire comprising a torus of flexible, substantially
4 inelastic material, wherein the material will not deform at temperature of about
5 225°F, the torus includes an inner diameter surface for engaging a tire supporting
6 rim and an outer diameter surface for contacting a support surface, wherein the

7 torus can flatten under a load to facilitate movement of the tire over soft or
8 irregular support surfaces, and a sealable opening for inflating and deflating the
9 torus, wherein said sealable opening comprises a valve stem housing and a valve
10 stem having a plurality of barbs which taper inwardly in the direction of the valve
11 stem housing;

12 at least one tire supporting rim comprising a cylindrical center section for
13 engaging the inner diameter surface of the tire, a pair of support flanges axially
14 extending from opposite sides of the center section for engaging the tire as it
15 flattens under a load; and

16 at least one axle interconnecting the rim and the frame such that the at least
17 one rim and the at least one tire may rotate.

1 41. The wheeled vehicle of claim 40 wherein the inside diameter of the
2 valve stem housing is less than the largest outside diameter of the valve stem.

1 42. The wheeled vehicle of claim 40 wherein the inside diameter of the
2 valve stem housing is less than at least about 50 % of the largest outside diameter
3 of the valve stem.

1 43. The wheeled vehicle of claim 40 wherein the valve stem comprises at
2 least 3 barbs.

1 44. The wheeled vehicle according to claim 40, wherein the vehicle is
2 selected from the group consisting of a wagon, a wheel barrow, a tricycle, a
3 stroller, a golf bag, pull cart, a small boat dolly, a beach cart, a beach wheelchair, a
4 one-wheeled cart, a two-wheeled cart, a three-wheeled cart, a four-wheeled cart, a
5 cart with more than four wheels, a hand truck, a backpack carrier, a luggage
6 carrier, and a vendor cart.

1 45. The wheeled vehicle according to claim 40, wherein the tire is blow
2 molded.

1 46. A method for moving a land vehicle, the method comprising:
2 at least one providing the vehicle with at least one low pressure tire
3 comprising a torus of flexible, substantially inelastic material, wherein the material
4 will not deform at temperature of about 225°F, the torus includes an inner
5 diameter surface for engaging a tire supporting rim and an outer diameter surface
6 for contacting a support surface, wherein the torus can flatten under a load to
7 facilitate movement of the tire over soft or irregular support surfaces, and a
8 sealable opening for inflating and deflating the torus wherein said sealable
9 opening comprises a valve stem housing and a valve stem having a plurality of
10 barbs which taper inwardly in the direction of the valve stem housing;
11 providing a tire supporting rim comprising a cylindrical center section for
12 engaging the inner diameter surface of the tire, a pair of support flanges axially
13 extending from opposite sides of the center section for engaging the tire as it
14 flattens under a load; and
15 moving the vehicle across the support surface while the vehicle is
16 supported on the tire.

1 47. The method according to claim 46, wherein the support surface includes
2 at least one member selected from the group consisting of light foam core
3 aluminum, sand, mud, asphalt, concrete, soil, grass, ice, snow, rock, gravel, leaves,
4 tree trucks, tree branches, and wood.

1 48. The method according to claim 46, wherein the tie is blow molded.

1 49. A method for making a tire, the method comprising:

2 blow molding a torus of flexible, substantially inelastic material, wherein
3 the material will not deform at temperature of about 225°F, the torus includes an
4 inner diameter surface for engaging a tire supporting rim and an outer diameter
5 surface for contacting a support surface, wherein the torus can flatten under a load
6 to facilitate movement of the tire over soft or irregular support surfaces; and

7 providing a sealable opening in the torus for inflating and deflating the
8 torus, wherein further comprises providing a pin in the mold during the blow
9 molding;

10 opening the mold and removing said pin and creating the inside diameter of
11 a valve stem socket;

12 inserting a valve stem into said socket wherein said valve stem comprises a
13 plurality of barbs.